THE MINISTER OF STATE IN THE DEPARTMENT OF SCIENCE AND TECHNOLOGY IN THE MINISTRY OF SCIENCE AND TECHNOLOGY (SHRI BACHI SINGH RAWAT) : (a) and (b) Yes Sir.

(c) No Sir.

(d) The matter has already been considered and decision of the competent authority has been duly intimated to the concerned employees.

Technology Mission for Sugar Industry

4783. SHRI C. RAMACHANDRAIAH: Will the Minister of SCIENCE AND TECHNOLOGY be pleased to state:

(a) whether it is a fact that Government have taken up a Sugar Technology Mission for technology upgradation of sugar industry;

(b) if so, what are the details of technologies undertaken for evaluation;

(c) what are the findings; and

(d) to what extent these have been implemented by the sugar industry?

THE MINISTER OF STATE IN THE DEPARTMENT OF SCIENCE AND TECHNOLOGY IN THE MINISTRY OF SCIENCE AND TECHNOLOGY (SHRI BACHI SINGH RAWAT): (a) to (d) Technology Information, Forecasting and Assessment Council (TIFAC) is implementing the Mission Mode Project Scheme on Sugar Production Technologies (STM) of Department of Science and Technology for improving the technical performance of the sugar industry.

The Mission has prepared modernization schemes for 30 sugar factories in the country focusing on energy conservation, higher plant efficiencies, capacity optimization and improvements in sugar quality. The Mission has also evaluated 20 new technologies so far. The details of the technologies undertaken for evaluation, findings and status of implementation are given as under:

(i) **Thin Film Sulphur Burner** for continuous generation of SO_2 gas to achieve satisfactory juice clarification parameters.

Findings: Saving of sulphur, low down time, avoidance of pollution, elimination of manual operation, higher clarification efficiency.

Project completed and the technology is replicated in a large number of sugar mills.

(ii) **PLC System for clarification Control**—PLC based control for Juice purification.

Findings: Stabilized juice flow, automatic control and monitoring of clarification process possible, gain in sugar recovery, saving of sulphur and lime (*i.e.* reduction in production cost.)

Project completed and the technology has been replicated in a number of sugar mills.

(iii) **Monitoring and Control System for Pan Boiling**—PLC based automatic controls for sugar crystallization at vacuum pans.

Findings: Automatic monitoring and control of sugar crystallization leading to low sugar loss in molasses, reduced pan boiling time, energy saving.

Project completed and the technology is under replication.

(iv) **Low Pressure Extraction System (LPE)**—a unique system for extraction of Juice from prepared sugarcane.

Findings: Power saving, low maintenance cost, low down time, low capital investment at sugarcane juice extraction section.

Project completed and the technology is ready for replication.

(v) **Syrup Treatment System**—for clarification of concentrated juice (syrup) prior to crystallization at vacuum pans.

Findings: Low sugar loss in molasses, better sugar quality and reduced processing time.

Project completed and the technology has been replicated in a number of sugar mills.

(vi) **NIR System for determination of sugar content in sugarhouse products**—a method of quick and reliable assessment of sugar content in sugarcane, juice, bagasse and other sugar house products.

Findings: Effective process control, reduces estimation error, assists in identifying areas of sugar losses and to reduce them. Quality based payment for sugarcane may be possible.

Project is under implementation at a sugar mill in west U.P.

(vii) **Short Retention Clarifier (SRC)** for low retention time of treated sugarcane juice during clarification.

Findings: Use of SRC leads to low inversion of sugar, less colour formation' during clarification. The technology is still under trial.

(viii) **Cane Separation System (CSS)**—A technology for separation of rind and pith of sugarcane before juice extraction to achieve juice quality of high order.

Findings: Extraction of juice through CCS system leads to saving of chemicals and produces sugar of superior quality. High revenue from sale of rind possible.

Commercial application of the technology does not appear to be feasible.

(ix) **Development of cost and energy effective materials for sugar industry components**—a new zinc Aluminium Alloy developed for use as bearings in sugar industry machinery.

Findings: The new alloy is a cheaper component material with comparable or better performance for use in sugar industry.

The commercial evaluation of the technology has been completed and is ready for replication.

(x) **Masssecuite Filter** for separation of crystals from mother liquor based on the principle of vacuum filtration.

Findings: Use of this technology leads to continuous operation, energy saving, avoidance of crystal breakage (Uniform product size).

Commercial evaluation of the technology is in progress.

(xi) **Decanter Centrifuge** for solid liquid separation during the deliquoring of clarifier underflow.

Findings: Use of decanter centrifuge for de-liquoring of clarifier underflow leads to low sugar losses in the solids, elimination of pollution due to bagacilo as no bagacillo is required as filter aid and power saving.

Commercial evaluation is completed and ready for replication.

(xii) **Separate Clarification of Vacuum Filtrates** for purification of vacuum filtrate separately to eliminate re-circulation of dirty filtrates to process.

Findings: Use of the technology leads to purity rise in vacuum filtrate by 1.5 to 2.5 units, treated juice is directly added to sulphured juice avoiding re-circulation leads to reduced sugar loss and better juice quality.

Commercial evaluation of the technology has been completed and the technology has been replicated in number of sugar mills.

(xiii) **Membrane Separation Technology**—Pilot scale trials conducted successfully through use of polymeric organic membranes for micro/ultra filtration for purification of sugarcane Juice.

Findings: Achieved a purity rise of 1 to 2 units, may lead to enhanced sugar recovery. Observed sparklingly clear juice for improved sugar quality. Lower consumption of chemicals during clarification.

(xiv) **Entrepreneur Resource Planning (ERP) System**—Use of IT for efficient plant maintenance and management control.

Findings: superior decision making for higher profitability.

The technique is being adopted by a few sugar mills.

(xv) **Raw Melt Sugar Refinery**—For production of low colour, superior quality international grade sugar.

Commercial evaluation of the technology has been completed and is under replication in two sugar mills.

(xvi) **PTH Device**—a system commercially evaluated to minimize fouling of evaporator heating surfaces based on the principle of neutralization of free electrons in the calcium ions.

Findings: Commercial evaluation of the technology has been completed and found to be technically/commercially unviable.

(xvii) **Juice Extractor**—a new method of extraction of juice using principle of displacement of high concentrated juice by low concentrated juice.

Commercial evaluation of the technology is underway.

(xviii) **Automation of Condensing & Cooling System**—a PLC based automation and control system to create vacuum at pans and evaporators efficiently.

Findings: Specific power consumption at condensing and cooling station is reduced to between 1.8 to 2.0 KWH per ton of cane crushed as against 4.6 KWH per ton of cane crushed conventionally. Maintenance of steady vacuum conditions at pans and evaporators.

Commercial evaluation of the technology completed and has been replicated in a few sugar mills.

(xix) **Planetary Gear Box**—an energy efficient Gear box to transmit the drive energy to mill roller for extraction of juice.

Findings: Better Power to weight ratio requires less space, higher efficiency (approx. 10% more), totally enclosed, less noise and vibrations, less oil consumption because of re-circulation of oil and less maintenance expenses. Commercial evaluation has been completed and the technology is ready for replication.

(xx) Chemically Modified Bagasse (CMB)

The laboratory scale R&D evaluation work in collaboration with Vasant Dada Sugar Institute, Pune has been completed, to explore feasibility of converting bagasse into a decolourising agent for decolourisation of sugarcane juice, by treatment with Amino based reagents. The technology is not viable commercially.

In the overall, the response of the sugar industry to the in plant demonstrations of modernization projects and new technology projects through Mission Mode approach, has been very encouraging and several multiplier actions are being effected by industries themselves based on these results and experiences.

TIFAC-Core centre in Bihar

4784. SHRIMATI SAROJ DUBEY: Will the Minister of SCIENCE AND TECHNOLOGY be pleased to state:

(a) the details of the Technology, Information, Forecasting and Assessment-Council's Centres of Relevance and Excellence (CORE), set up at various places in the country and the purpose to be achieved thereby;

(b) whether it is propose to set up any such centre in Bihar; and

(c) if so, its location?

THE MINISTER OF STATE IN THE DEPARTMENT OF SCIENCE AND TECHNOLOGY IN THE MINISTRY OF SCIENCE AND TECHNOLOGY (SHRI BACHI SINGH RAWAT): (a) to (c) Technology Information, Forecasting and Assessment Council (TIFAC)